[Federal Register: May 13, 1994]

DEPARTMENT OF THE INTERIOR
40 CFR Part 63

[AD-FRL-4881-4]
RIN 2060-AD02

Federal Standards for Marine Tank Vessel Loading and Unloading Operations and National Emission Standards for Hazardous Air Pollutants for Marine Tank Vessel Loading and Unloading Operations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of proposed rulemaking and notice of public hearing.

SUMMARY: Standards implementing two provisions of the Clean Air Act (the Act) are being proposed by today's notice. One set of standards is proposed under section 183(f) of the Act and would limit air emissions of volatile organic compounds (VOC) and hazardous air pollutants (HAP) from new and existing marine tank vessel loading and unloading operations. These standards would require the application of reasonably available control technology (RACT).

An additional set of standards is proposed under section 112(d) of the Act and would limit air emissions of HAP from new and existing marine tank vessel loading and unloading operations. These proposed national emission standards for hazardous air pollutants (NESHAP) would require existing and new major sources to control emissions using the maximum achievable control technology (MACT).

DATES: Comments: Comments must be received on or before July 18, 1994.

Public Hearing: A public hearing will be held on June 15, 1994 beginning at 9:30 a.m.

ADDRESSES: Comments: Interested parties may submit comments (in duplicate if possible) to: Air and Radiation Docket and Information Center (6102), Attention: Docket No. A-90-44, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. The Agency requests that a separate copy also be sent to the contact person listed below.

Public Hearing: The public hearing will be held at the EPA's Office

of Administration Auditorium, Research Triangle Park, North Carolina. Persons wishing to present oral testimony should contact Ms. Lina Hanzely, Chemicals and Petroleum Branch (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5673 by the dates specified above.

Technical Support Document: The technical support document (TSD) for the proposed standards may be obtained from the U.S. Department of Commerce, National Technical Information Service (NTIS), Springfield, Virginia 22161, telephone number (703) 487-4650. Please refer to ``Technical Support Document for the Development of an Emissions Standard for Marine Vessel Loading Operations" (NTIS number PB93-793910, EPA 450/3-92-001a). Electronic versions of the TSD as well as this proposed rule are available for download from the EPA's Technology Transfer Network (TTN), a network of electronic bulletin boards developed and operated by the Office of Air Quality Planning and Standards. The TTN provides information and technology exchange in various areas of air pollution control. The service is free, except for the cost of a phone call. Dial (919) 541-5742 for up to a 14,400 bits per second (bps) modem. If more information on TTN is needed contact the systems operator at (919) 541-5384.

Docket: Docket No. A-90-44, containing supporting information used in developing the proposed standards, is available for public inspection and copying from 8 a.m. to 4 p.m., Monday through Friday, at the EPA's Air and Radiation Docket and Information Center, Waterside Mall, room M-1500, Ground Floor, 401 M Street, SW., Washington, DC 20460. The proposed regulatory text and other materials related to this rulemaking are available for review in the docket. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. David Markwordt, Chemicals and Petroleum Branch, Emission Standards Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-0837.

SUPPLEMENTARY INFORMATION: The information presented in this preamble is organized as follows:

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The proposed regulatory text is not included in this Federal Register notice, but is available in Docket No. A-90-44 or by request from the EPA contact persons designated earlier in this notice free of charge. The proposed regulatory language is also available on the EPA's Technology Transfer Network (TTN). See the Docket section of this preamble for more information on accessing TTN.

I. Background

A. History

In 1982, the U.S. Department of Transportation's Maritime Administration (MARAD) began working with the EPA regarding the establishment of Federal regulations under the Clean Air Act pertaining to air pollutants emitted from commercial marine vessels. The MARAD raised concerns regarding the potential disruption of interstate and foreign commerce and safety problems that may result from State regulation of marine vessel emissions. The MARAD believed that the most appropriate method to control these emissions without causing undue disruption of commerce or safety problems would be for the EPA to

promulgate national standards regulating air pollutants from these sources.

In 1985, the U.S. Department of Transportation requested that the National Academy of Sciences' National Research Council (NRC) evaluate the feasibility of controlling emissions from marine tank vessel loading operations. At that time, many States were already considering vapor controls for barge and tankship loading and tankship ballasting. The NRC Commission on Engineering and Technical Systems (CETS) then convened a Committee on Control and Recovery of Hydrocarbon Vapors from Ships and Barges. This committee operated under the guidance of the Marine Board of the NRC. The committee and the Marine Board consisted of members of industry and academia and State representatives. The Coast Guard (U.S. Department of Transportation) and the EPA also worked with the committee on the feasibility study. In 1987, the committee issued its report ``Controlling Hydrocarbon Emissions From Tank Vessel Loading'' (Docket A-90-44, item II-I-4).

The Marine Board's report determined that controls were technically feasible but that there was a need for the Coast Guard to promulgate safety requirements and a need for the EPA to set uniform emissions standards to mitigate some of the safety issues that could arise from varied State regulations. The report recommended that the Coast Guard ``lead the development and implementation of a coordinated program to ensure the safety and standardization of maritime hydrocarbon vapor emissions controls.'' The Coast Guard would be responsible for the safety issues involved (standardized equipment, detonation arrestors, personnel training, etc.), and the EPA would be responsible for the emissions standards. One of the methods suggested to achieve the coordination necessary to develop standards for marine tank vessel loading operations was an amendment to the Act.

Part of the Marine Board's task was to develop cost estimates. The Marine Board contracted United Technical Design (UTD) to develop cost estimates for three different model terminals and four model vessels. These model terminals and costs served as the basis for the EPA costs (Docket A-90-44, item II-I-5).

In response to the NRC recommendation, the Coast Guard's Chemical Transportation Advisory Committee (CTAC) formed a Subcommittee on Vapor Control to develop standards for designing and operating vapor control systems. This CTAC subcommittee presented its final recommendations to the Coast Guard in February 1989. The Coast Guard standards for safe design, installation, and operation of marine vapor recovery equipment were promulgated in June 1990 (55 FR 2596). The Coast Guard regulations are found in 33 CFR part 154 and 46 CFR part 39.

As a result of the NRC recommendation, Clean Air Act Amendments of 1990 (the 1990 amendments) added a new section to the Act, section 183(f), that requires the EPA to promulgate standards applicable to

emissions of VOC and other air pollutants resulting from the loading and unloading of tank vessels.

The 1990 amendments also revised section 112 of the Act to require the EPA to publish a list of categories of major sources and area sources of listed HAP and to promulgate emissions standards for each listed category of emission sources. In the Agency's initial list of categories of sources to be regulated under section 112(c) of the Act, the marine vessel loading and unloading source category was not listed because the Agency intended to regulate the emissions of HAP as well as VOC under the authority of section 183(f) of the Act (57 FR 31566, July 16, 1992). After publication of this initial list of source categories, the Agency decided to regulate HAP emissions from major sources of marine vessel loading and unloading facilities under authority of section 112 of the Act (58 FR 60021, November 12, 1993).

B. Legal Authority for Tank Vessel Standards

1. Clean Air Act Section 183(f)

Section 183(f) of the Act requires the Administrator, in consultation with the Secretary of the Department in which the Coast Guard is operating, to

> Promulgate standards applicable to the emissions of VOC and any other air pollutant from loading and unloading of tank vessels (as that term is defined in section 2101 of title 46 of the United States Code) which the Administrator finds causes, or contributes to, air pollution that may be reasonably anticipated to endanger public health or welfare. Such standards shall require the application of reasonably available control technology, considering costs, any non-air-quality benefits, environmental impacts, energy requirements and safety factors associated with alternative control techniques.

The Act further directed the Administrator to limit the application of the standards, to the extent practicable, to loading and unloading facilities and not to tank vessels. The standards were to be promulgated within 2 years after enactment of the amended Act and must be effective within 2 years of promulgation. The Coast Guard was directed to issue regulations ``to insure the safety of the equipment and operations which are to control emissions from the loading and unloading of tank vessels * * *."

2. Clean Air Act Section 112

Title III of the 1990 amendments revised section 112 of the Act to reduce the amount of nationwide air toxics emissions. Under title III, section 112 was amended to give the EPA the authority to establish

national standards to reduce air toxics from industries that generate these emissions. Section 112(b) contains a list of 189 HAP, the emissions of which are to be regulated. Specific HAP on the list include benzene (including benzene from gasoline), toluene, and hexane. Section 112(c) directs the EPA to use this pollutant list to develop and publish a list of all categories of major and area sources of the pollutants on the HAP list. National emissions standards for hazardous air pollutants (NESHAP) will be developed for each of the source categories on that list. The list of source categories was published in the Federal Register on July 16, 1992 (57 FR 31576) and was revised to include marine vessel loading and unloading operations on November 12, 1993 (58 FR 60021).

The NESHAP are to be developed to control HAP emissions from both new and existing major and area sources according to the statutory directives set out in section 112(d) of the Act. (Section 112(a) defines a major source as any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering control, 10 tons per year or more of any HAP or 25 tons per year of any combination of HAP. An area source is any stationary source that is not considered ``major''.) The statute requires the standards to reflect the maximum degree of reduction in emissions of HAP that is achievable for new or existing sources. This control level is referred to as the ``maximum achievable control technology (MACT)'', the selection of which must reflect consideration of the cost of achieving the emission reduction, any nonair quality health and environmental impacts, and energy requirements for control levels more stringent than the MACT floors.

The MACT floor is the minimum stringency level for MACT standards. For new sources, MACT must be no less stringent than the level of emission control already achieved in practice by the best controlled similar source. For existing sources, MACT must be no less stringent than the average emission limitation achieved by the best performing 12 percent of existing sources or the best performing 5 sources in categories or subcategories with fewer than 30 sources.

Once the floor has been determined for new or existing sources for a category or subcategory, the Administrator must set MACT standards that ``shall require the maximum degree of emission reduction of the hazardous air pollutants subject to this section * * * that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources * * *.'' These standards must be no less stringent than the MACT floor. Such standards must then be met by all sources within the category or subcategory. In establishing standards, the Administrator may distinguish among classes, types, and sizes of

sources within a category or subcategory.

C. Process Description and Description of Control Technologies

1. Process Description

Marine tank vessel loading operations are facilities that load and unload liquid commodities (e.g., crude oil, gasoline, jet fuel, kerosene, toluene, alcohols, fuel oil Numbers 2 and 6, some chemicals, and groups of solvents or petrochemical products, etc.) in bulk. The cargo is pumped from the terminal's large, above-ground storage tanks through a network of pipes and into a storage compartment (tank) on the vessel. Most marine tank vessel loading operations are associated with petroleum refineries or synthetic organic chemical manufacturers, or are independent terminals.

Gasoline, crude oil, and other VOC- and HAP-emitting commodities are normally delivered from refinery to terminal or terminal to terminal via pipeline, ship, or barge. During marine tank vessel loading operations, emissions result as the liquid that is being loaded into the vessel displaces vapors from the vessel's tank. The vapors emitted fall into two categories: Arrival emissions and generated emissions. Arrival emissions are attributed to any vapors remaining in the otherwise empty cargo tanks prior to loading. Generated emissions refer to vapors resulting from the evaporation of the liquid cargo as it is loaded. The ratio of arrival vapors to generated vapors can vary greatly depending upon the liquid, vapor pressure, loading method, and loading conditions.

The major emission points for marine vessel loading operations include open tank hatches and overhead vent systems. Overhead vent systems collect vapors displaced during loading and route them to a vertical pipe or stack. The vapors are released well above the height of the deck with an upward velocity to help isolate the vapors from the deck. Other possible emission points are hatch covers or domes, pressure-vacuum relief valves, seals, and vents.

Emissions may also occur during ballasting, which is the process of drawing ballast (i.e., water) into a cargo hold. When ballast is loaded into tanks that contain vapors from the preceding cargo, the vapor is displaced and emitted from the vessel. Most tankships carrying crude oil built since 1980 are required by domestic law and international agreement to use segregated ballast tanks, which prevent the possibility of ballast emissions (see also: The Port and Tanker Safety Act (1978), the Act to Prevent Pollution from Ships (1980), the Marine Vapor Control System Standards (55 FR 25396, June 21, 1990); and the Double Hull Standards for Tank Vessels Carrying Oil (57 FR 36221, August 12, 1992). However, some older and smaller tankships may be exempt from these requirements. Inland barges do not carry ballast.

2. Control Technologies

The description of control technologies has two components, the capture of vapors and the destruction or recovery of VOC and HAP. The capture of vapors at the marine vessel requires that the compartments on both tankships and barges be closed to the atmosphere during loading. Most tankships are already equipped for closed loading as a result of having inert gas systems on board because closed loading is necessary to maintain the legally required minimum inert gas pressure in the cargo tanks in accordance with Coast Guard regulations (46 CFR 32.53 and 46 CFR 153.500). Barges generally do not use inert gas and are usually open loaded. Equipment necessary for closed loading includes (1) devices to protect tanks from underpressurization and overpressurization, (2) level-monitoring and alarm systems to prevent overfilling, and (3) devices for cargo gauging and sampling.

The vapor emissions captured from marine tank vessel loading operations can be controlled using one of two primary methods: Combustion or recovery. Combustion devices include flares, enclosed flares, and thermal and catalytic incinerators. The primary recovery methods are carbon adsorption, absorption, vapor balancing, and refrigeration. (For a more complete discussion of the capture and control techniques, consult the technical support document (TSD) previously mentioned in the ADDRESSES section.)

II. Summary of the Proposed Standards

The following summarizes the proposed standards. A full discussion of the rationale underlying these proposed regulations is found in part III.

A. Source Category To Be Regulated

The source category to be regulated is major source marine tank vessel loading and unloading operations. Regulations will require those operations exceeding certain gasoline or crude oil throughput cutoffs or certain HAP emissions cutoff at major sources to install vapor control systems. Approximately 300 marine tank vessel loading and unloading operations would be affected by these proposed regulations. Vessels loading at affected sources must meet vapor tightness criteria in order to load product.

The source category includes only emissions that are directly caused by the loading and unloading of bulk liquids at points where marine terminal equipment is connected to marine vessel sources. Thus, this source category does not include storage tanks and leaking equipment associated with terminal transfer operations. Nor does this source category include emissions from offshore vessel-to-vessel bulk

liquid transfer operations (i.e., lightering operations). Lightering operations do not take place at onshore terminals. The Agency may consider addressing lightering operations in a separate source category.

B. Pollutants To Be Regulated

The pollutants to be regulated are all VOC and HAP emitted during marine tank vessel loading and unloading operations.

C. Proposed Standards

The proposed standards are developed under sections 183(f) and 112(d) of the Act. As discussed above, section 183(f) requires the promulgation of standards implementing reasonably available control technology (RACT). Section 112(d) requires the promulgation of maximum achievable control technology (MACT), which is selected using different criteria than are used for determining RACT. As a result, RACT standards developed under section 183(f) have somewhat different applicability criteria, as well as a different level of emissions reduction, compared to the section 112(d) MACT standards. However, the majority of requirements (e.g., reporting, recordkeeping, performance tests, monitoring) are identical. In order to simplify the regulatory process, both sets of standards, RACT and MACT, are presented in a single regulation and proposed under 40 CFR part 63.

1. Proposed RACT Standards

Existing and new sources exceeding either of the throughput cutoffs of 790 million liters per year (L/yr) (5 million barrels per year (bbl/yr)) of gasoline or 16 billion L/yr (100 million bbl/yr) of crude oil must meet the RACT requirement of capture and control of vapors from marine vessel loading operations. The EPA believes that approximately 25 terminals will be required to install controls under these proposed standards. The RACT for marine vessel loading operations is a capture system consisting of a vapor tight marine vessel and all of the piping and equipment necessary to route all VOC vapors to a control device connected to either a thermal destruction device or a recovery device. If a thermal destruction device is used to process vapors, 98 percent destruction efficiency must be achieved. If a recovery device is used to process the vapors, 95 percent recovery must be achieved, or as an alternative, for recovery of gasoline vapor emissions, a source must ensure an outlet concentration of 1,000 parts per million by volume (ppmv) or less.

2. Proposed MACT Standards

New marine vessel loading operations exceeding 1 megagram per year (Mg/yr) (1.1 tons per year) of uncontrolled HAP emissions that are

located at major sources must meet the MACT requirement of capture and control of vapors from marine vessel loading operations. The MACT for new marine vessel loading operations is a capture system consisting of a vapor tight marine vessel and all of the piping and equipment necessary to route all VOC vapors to a control device that is capable of reducing HAP emissions to the atmosphere by 98 percent.

Existing marine vessel loading operations exceeding approximately 1 Mg/yr of HAP emissions that are located at major sources must meet the same vessel tightness requirements as new sources. The EPA believes that approximately 300 terminals will be affected by these proposed standards. These operations will have a MACT emissions requirement of 93 percent emission reduction. Control devices used to achieve this emission limit are required to operate at 95- and 98 percent removal efficiencies respectively. However, these facilities have the option of exempting emissions of one or more commodities from control provided an overall 93 percent emission reduction is achieved. This overall emission reduction may be demonstrated by controlling all but a few commodities loaded. Partial control of any given commodity would not be allowed under the proposed compliance provisions.

At both new and existing sources, emissions from ballasting operations would be prohibited. Emissions of HAP from steam stripping used to regenerate carbon beds when carbon adsorption is used to control emissions from marine vessel loading operations would also be prohibited under today's proposed standards.

3. Source Reduction and Recycling

The Pollution Prevention Act of 1990 (Pub. L. 101-508; 42 U.S.C. 13101 et seq., ER 71:0501) establishes the following pollution prevention hierarchy as national policy:

a. Pollution should be prevented or reduced at the source wherever feasible;

b. Pollution that cannot be prevented should be recycled in an environmentally safe manner wherever feasible;

c. Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner wherever feasible; and

d. Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Pollution prevention means ``source reduction,'' as defined under the Pollution Prevention Act, and other practices that reduce or eliminate the creation of pollutants. Source reduction is any practice that reduces the amount of any hazardous substance entering the waste stream or otherwise released into the environment prior to recycling, treatment, or disposal. Source reduction does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through

a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service. Under the Pollution Prevention Act, recycling, energy recovery, treatment and disposal are not included within the definition of pollution prevention. Some practices commonly described as ``in-process recycling'' may qualify as pollution prevention.

Pollution prevention principles have been incorporated into the proposed marine vessel standards. The proposed prohibition of emissions from ballasting and steam stripping operations has the effect of preventing pollution from occurring at the source. Alternative processes (i.e., segregated ballast tanks and vacuum regeneration) are readily available, widely used, and have the benefit of not resulting in HAP or VOC emissions.

Although not considered pollution prevention, vapor recovery and recycling is a common practice in this industry, particularly gasoline recovery (the lower vapor pressure crude oils are less conducive to recovery and are more likely to foul the carbon bed). The proposed standards encourage vapor recovery by allowing the use of well-operated and maintained recovery devices that operate at 95-percent emission reduction. Recovery devices are desirable compared to combustion devices because the recovered compounds can be reused in other processes, which reduces the quantity of virgin materials that must be produced. Recovery devices also tend to generate fewer secondary pollution impacts than do combustion devices.

D. Emission Points To Be Regulated

The emission points to be regulated include all means of venting the tank during loading of product or ballast. These include, but are not limited to, open hatches and/or overhead vent systems. The proposed rulemakings will not directly regulate seals, hatches, or covers associated with the marine tank vessel. However, these items must be in satisfactory condition for the vessel to pass one of the three different marine tank vessel tightness tests, and must remain closed during the loading process.

E. Format for the Proposed Standards

The chosen format for the standards for product loading is a percentage of mass emissions reduction. An alternative format for gasoline vapor recovery, a maximum allowable concentration for the vapor processor exhaust is also proposed. Emissions are prohibited from ballasting operations and from regeneration of carbon adsorber beds.

F. Compliance Deadline

The compliance deadline for existing sources affected by the RACT standards is 2 years after the date of promulgation. The compliance deadline for existing sources affected by the MACT standards is 2 years after the date of promulgation. An existing source that subsequently exceeds a RACT throughput cutoff will have 2 years to comply once the source exceeds a throughput cutoff. Similarly, any source that exists as of the effective date of the standards and subsequently exceeds the MACT applicability thresholds would have 2 years to comply with the existing source MACT standards. All other new or reconstructed facilities will have to comply upon startup, with the exceptions noted in Sec. 63.6 of the part 63 General Provisions.

G. Initial Performance Tests

Owners or operators must perform initial performance tests as required by Sec. 63.7 of the General Provisions for all combustion or recovery devices except devices such as boilers or process heaters where the emissions stream is the primary fuel or boilers and process heaters having a design heat input capacity of 44 megawatts or more. The test method for compliance for combustion devices is the EPA Method 25 of appendix A of 40 CFR part 60. The test method for compliance for recovery devices is the EPA Method 25A of appendix A of 40 CFR part 60. Flares are not subject to the same tests as other control devices, but must pass a visible emissions test according to the requirements of Method 22 of appendix A of 40 CFR part 60. The performance tests must be conducted to include the loading of the last 20 percent of a compartment, and may be spread out over multiple compartments.

H. Vessel Tightness Testing

Three alternatives to ensure vessel tightness are proposed: (1) Pressure test the vessel, (2) perform a leak test on all components using Method 21 of appendix A of 40 CFR part 60, or (3) load the vessel at less than atmospheric pressure.

I. Monitoring

Owners or operators using a vent system that contains valves that could divert a vent stream from a control device must either monitor vent stream flow to ensure that it is not diverted from a control device or secure the bypass line valve in the closed position.

Monitoring criteria have been established for combustion devices (except flares), carbon adsorbers, condensers and adsorbers. In general, facilities would be required to establish operating parameters during the initial performance test and then monitor combustion

temperature for combustion devices, VOC concentration in the exhaust stream outlet for carbon adsorbers, exhaust stream temperature for condensers, and VOC outlet concentration for adsorbers. In the case of flares, owners or operators would be required to monitor for the continuous presence of a flame and to monitor vent stream flow. Owners or operators seeking to use other types of control devices may develop enhanced monitoring criteria for these devices and submit the criteria to the Administrator for approval.

J. Recordkeeping and Reporting

Sources required to install controls would have to fulfill the reporting and recordkeeping requirements of the part 63 General Provisions including submittal of the following reports: (1) Compliance notification report, (2) notification of initial performance test, (3) report of initial performance test, (4) quarterly parameter exceedance report, and (5) quarterly emissions estimation report. These sources must also maintain documentation that vessels loaded at the facility are vapor tight. All information will be made readily available to the Administrator or delegated State authority for a minimum of 5 years.

III. Rationale

A. Selection of Affected Sources

The primary release of vapors during the marine tank vessel loading process occurs at the tank vessel through hatches, vents, and vent systems. However, it is impractical for marine tank vessels to carry their own vapor processing systems given the limited space on individual vessels. It is also much more economical for terminals to install and operate control devices that are capable of controlling emissions from multiple vessels than for each vessel to control its own emissions. Furthermore, section 183(f) requires that ``to the extent practicable such standards shall apply to loading and unloading facilities and not to tank vessels." Therefore, these regulations require that terminals install an air pollution control device and a means of routing the air/vapor mixture from the vessel to the air pollution control device.

Vessels will not be allowed to load or unload product unless they are compatible with terminal air pollution control systems or have a self contained emissions control system on board. Therefore, vessels loading at a controlled terminal will need to have their own vapor collection systems (i.e., pipes which allow for connection to terminal air pollution control system) in order to route vapors to shore. However, vessels are not required to load at controlled terminals. As a

result, the affected source is limited to the terminal, which is in turn required to capture and control all loading emissions, with the exception of ballasting and off-shore terminal emissions which are discussed elsewhere in this preamble. Emissions from off shore vessel-to-vessel bulk liquid transfer operations (i.e., lightering operations) are also not included as a source affected by these standards because these operations do not take place at onshore terminals.

B. Selection of Pollutants To Be Regulated

Section 183(f) of the Act states that the Administrator shall ``promulgate standards applicable to the emission of VOC and any other pollutant from loading and unloading of tank vessels which the Administrator finds causes, or contributes to, air pollution that may be reasonably anticipated to endanger public health or welfare." Under section 112(d), the EPA is also required to regulate the emissions of HAP from source categories listed pursuant to section 112(c). Marine vessel loading operations were listed on November 12, 1993 (58 FR 60021). In the absence of regulation, the EPA estimates that 75,200 Mg/yr of VOC will be emitted as a result of tank vessel loading operations. Approximately 8,000 Mg/yr of these VOC emissions will be emissions of HAP. Tank vessel loading operations emit approximately 53 different substances listed as HAP under section 112(b) of the Act. Such emissions include unregulated benzene emissions of about 700 Mg/yr. In addition, approximately 6,900 Mg/yr of hexane, toluene, xylene compounds, ethyl benzene, iso-octane, MTBE, naphthalene, and cumene are emitted from tank vessel loading operations. Approximately 44 HAP comprise the remaining four percent of toxic emissions.

Benzene is a known human carcinogen. It has been demonstrated to increase the incidence of nonlymphocytic leukemia in occupationally exposed individuals. It has also been linked to other leukemias, as well as lymphomas and other tumor types in animal studies. Benzene has also been associated with a number of adverse noncancer health effects, including effects on the blood system and the immune system. The other HAP identified above also may induce adverse health effects, including depression of the central nervous system, upper respiratory tract and eye irritation, skeletal abnormalities, anemia, cataracts, kidney damage and liver damage.

As a result of its authority to regulate emission from tank vessel loading operations under both section 183(f) and section 112(d), the EPA shall regulate emissions of VOC and those HAP included on the list under section 112(b) in this rulemaking.

C. Selection of Basis and Level of the RACT Standards

1. Development of Regulatory Alternatives

In deciding how to implement the RACT provisions of section 183(f), the EPA had to determine whether or not all tank vessel loading terminals should be subject to the standards (i.e., whether there should be ``cutoffs'' below which a terminal would not be subject to the standards) and what level of control would be appropriate. Consistent with the requirements of section 183(f) calling for the consideration of costs and other non-air quality impacts, as well as the general requirements under RACT to review economic feasibility, the EPA believes that section 183(f) gives the EPA the flexibility to determine the level and scope of regulation that is most appropriate for terminal facilities, given all of the factors indicated.

Assuming 100 percent capture of emissions (which can be assumed when vapor tight vessels are loaded), the overall level of control is determined by the efficiency of the control device to which emissions are ducted. Currently, recovery devices (e.g., carbon adsorption, absorption, vapor balancing and refrigeration) are capable of achieving a 95 percent efficiency compared to a 98 percent efficiency achieved by thermal destruction (combustion) devices (e.g., flares, enclosed flares, and thermal and catalytic incinerators). Additional information and descriptions of these control technologies are found in the TSD for this rulemaking (see ADDRESSES section). For purposes of the regulatory alternative analysis, the use of a thermal destruction device (i.e., 98 percent efficiency) was assumed. The control technologies selected for this regulation are discussed in part 4 below.

The next step was to identify regulatory alternatives that would allow the EPA to choose among different optimal cutoffs specifying what types of terminals would have to install control devices. The EPA chose commodity and throughput as factors to distinguish among alternatives because commodities with higher vapor pressures have higher emissions and, for a given commodity, terminals with higher throughput loading similar vessels have higher emissions.

Table 1 is a summary of the five regulatory alternatives developed by the EPA. The regulatory alternatives varied in stringency from controlling all emissions at all facilities to controlling only gasoline loadings at terminals with annual throughputs greater than 1,590 million liters (10 million bbl/yr) and crude oil terminals with throughputs greater than 15,900 million liters/yr (100 million bbl/yr). The control levels are all based on the capture of loading emissions from marine vessels and a 98 percent removal efficiency. Each regulatory alternative is structured such that the emissions and resulting cost-effectiveness values from each commodity at the stated throughput are roughly equivalent. For example, the costs of controlling emissions from 10 million barrels of gasoline is treated as being roughly equivalent to the costs of controlling emissions from 100

million barrels of crude oil because the emissions per volume of gasoline is ten times higher than for crude oil. (For a more complete rationale behind the selection of the regulatory alternatives, consult the technical support document (TSD) previously mentioned in the ADDRESSES section.)

Table 1.--RACT Regulatory Alternatives<SUP>a

Alternatives, throughput (MM bbl/yr)	VOC emissions reduction, Mg/yr<SUP>b	Percent VOC emissions reduction<SUP>b	No. of affected terminals	Capital costs, $ million<SUP>c	Annual costs, $ million<SUP>c	Incremental Cost effectiveness, $/Mg	Incremental cost effectiveness, $/Mg
I. Gasoline >10 MM bbl/yr.....	53,200	66	13	220	41	770	N/A
Crude oil >100 MM bbl/yr							
II. Gasoline >5 MM bbl/yr.....	58,100	72	25	280	53	910	2,500
Crude oil >100 MM bbl/yr							
III Gasoline >1 MM bbl/yr.....	64,500	80	60	420	85	1,300	5,000
Crude oil >10 MM bbl/yr							
IV. Gasoline >0.5 MM bbl/yr.....	66,900	83	120	570	120	1,800	15,000
Toluene >0.5 MM bbl/yr							
Alcohols >1.5 MM bbl/yr							
Crude oil >5 MM bbl/yr							
V. All terminals.....	72,000	98	1,500	2,600	610	8,500	96,000

A<SUP>a Terminals affected by State regulations or loading less than 1,000 bbl/yr are not included in the above estimates.
A<SUP>b Based on a 98-percent control efficiency and total VOC emissions of 74,000 Mg/yr.
A<SUP>c Costs are in 1990 dollars.

ASource: Docket A-90-44, items II-A-23 and II-A-32.

The analysis leading to a decision to regulate emissions from

ballasting and steam stripping operations is presented in section D, Selection of MACT Regulatory Approach.

2. Impacts of the Regulatory Alternatives

The EPA developed model (i.e., example) vessels and terminals for use in estimating the environmental, cost, and economic impacts associated with the actual terminals represented by the waterborne commerce in the United States (WCUS) data base. The impacts that resulted from this analysis are presented in Tables 1 through 3. The EPA performed an economic impact analysis of the regulatory alternatives considered for these regulations. Potential price, output, and employment impacts for affected products and for the marine transport industry and for small businesses were examined. Estimated maximum price increases for any product loaded in bulk varied but were not large under any of the regulatory alternatives. These price increase estimates reflect the control cost increase for both transporting crude and transporting refined products. Because the price increases are small and because the elasticities of demand for petroleum products are small, estimated percent output (i.e., throughput) reductions were minimal in all but Regulatory Alternative V. Correspondingly, estimated employment reductions were also small (less than 20) in all but Regulatory Alternative V.

Table 2.--Secondary Air and Energy Impacts of RACT Regulatory Alternatives<SUP>a <SUP>b

Alternatives, throughout (MM bbl/yr)	SO<INF>X emissions, Mg/yr<SUP>c	NO<INF>X emissions, Mg/yr<SUP>c	CO emissions, Mg/yr<SUP>c	Electricity impacts, MWh/yr<SUP>d	Natural gas impacts, 1,000 ft\3\/yr<SUP>d
I. Gasoline >10 MM bbl/yr.....	61	130	120	3,000	340,000
Crude oil >100 MM bbl/yr					
II. Gasoline >5 MM bbl/yr.....	61	150	140	5,400	620,000
Crude oil >100 MM bbl/yr					
III. Gasoline >1 MM bbl/yr.....	65	180	170	11,000	1,300,000
Crude oil >10 MM bbl/yr					
IV. Gasoline >0.5 MM bbl/yr.....	65	190	180	20,000	2,200,000
Toluene >0.5 MM bbl/yr					
Alcohols >1.5 MM bbl/yr					
Crude oil >5 MM bbl/yr					
V. All terminals.....	69	250	230	170,000	16,000,000

<SUP>aTerminals affected by State regulations or loading less than 1,000 bbl/yr are not included

in the above
estimates.
<SUP>bBased on use of incineration.
<SUP>cThese impacts represent increases in emissions; increases would not be expected if all affected sources used
recovery technologies.
<SUP>dThese impacts represent increases in energy usage.

Source: Docket A-90-44, item II-A-24.

Table 3.--Summary of RACT Economic Impacts by Regulatory Alternative

Reg. alt.	Terminals covered/ throughout, MM BBL/ yr	Total cost, MM	Maximum percent price increases	Percent output reductions	Employment reductions	No. of terminals under competitive pressure	Impact on vessels	Displacement potential by pipeline
I.....	Gasoline >10.0.....	41	0.16-0.19	0.02	<50	0	Low level of dedication.	Minimal.
	Crude oil >100.....	.....	0.10-0.18	ND	.....	.....	.....	.....
II.....	Gasoline >5.0.....	53	0.18-0.21	0.02	<50	0-5	Low level of dedication.	Minimal.
	Crude oil >100.....	.....	0.10-0.18	ND	.....	.....	.....	.....
III.....	Gasoline >1.0.....	85	0.25-0.29	0.02	.....	.....	Moderate level of dedication.	Minimal.
	Crude oil >10.0.....	.....	0.18-0.31	ND	119	0-30	.....	.....
IV.....	Gasoline >0.5.....	120	0.32-0.37	0.03	.....	.....	Significant level of dedication.	Minimal.
	Crude >5.0.....	.....	0.18-0.32	ND	165	0-65	.....	.....
	Alcohols >1.5.....	.....	0.60	0.04	.....	.....	.....	.....

Toluene >10.0.....	.....	0.41	.....	.....	.....	.....	
V.....	All.....	610	0.3-1.8	0.07-0.26	924	>1,000	High level of dedication to regulated products. Some in long run.

ND=Not determinable, function of other products derived from crude oil.

Reference: Docket A-90-44, items II-A-23 and II-A-32.

Because today's proposed regulation involves the application of both RACT and MACT, impacts for each standard were determined separately. In order to avoid overestimation or double-counting, and because the requirements for RACT are more stringent than MACT, the impacts for facilities affected by RACT (i.e., facilities with gasoline throughputs of greater than 790 million L/yr (5 million bbl/yr) or crude oil throughputs of greater than 16 billion L/yr (100 million bbl/yr)) were calculated first, and were discounted when determining the impacts for facilities affected by MACT (i.e., facilities emitting greater than 1 Mg/yr of HAP).

3. RACT Threshold Determination

The Administrator is proposing Regulatory Alternative II as the regulatory threshold for the RACT standard. Regulatory Alternative II would require controls for crude oil loadings at facilities with an crude oil marine throughput of approximately 15,900 L/yr (100 million bbl/yr) or more, and gasoline loadings at facilities with a gasoline throughput of approximately 795 million L/yr (5 million bbl/yr). Approximately 25 terminals (1.5 percent of all terminals) will be affected if the thresholds for Regulatory Alternative II are implemented. In addition, under this alternative, only a small volume of U.S. marine vessels will need to be retrofitted. It is anticipated that only those vessels that are least costly to retrofit would be retrofitted. Approximately 76 percent of the VOC emissions from all marine terminals would be controlled at an average cost effectiveness of approximately $770/Mg of VOC reduced under Regulatory Alternative II.

The Administrator believes that the incremental cost effectiveness ($5,000/Mg) of going beyond Regulatory Alternative II is inappropriate given this standard.

Regulatory Alternative III was strongly considered. However, the additional 35 terminals controlled under Regulatory Alternative III would produce only an additional eight percent reduction in nationwide emissions. Of those 35 additional terminals, as many as 25 could be

under increased competitive pressure, compared to only up to five terminals under Regulatory Alternative II. (Increased competitive pressure refers to the situation where the controlled terminal is in direct competition with a much smaller or larger terminal. The smaller terminal may not be controlled and the larger terminal may be able to control vapors more effectively on a per-barrel basis. The controlled terminal could be forced to absorb some of the control costs, reduce throughput, substitute nonregulated products, or close the facility.)

Additionally, the more stringent regulatory alternatives considered involved control of commodities which have vapor pressures much lower than gasoline and crude oil. Emissions generally correspond to the vapor pressure of the commodity being loaded. Gasoline and crude oil generally have the highest vapor pressures, and therefore present better control alternatives. Because the economic and other environmental impacts of Regulatory Alternative II are reasonable and should not place an undue burden on industry or the environment, the Administrator selected Regulatory Alternative II as representative of RACT.

4. Selection of Emission Control Technologies and Emission Control Standards for RACT

Control of marine vessel loading emissions requires the capture of displaced vapors and efficient control of vapors once captured. Vessels loading at facilities with controls must install a vapor collection system and pass one of three tank vessel tightness alternatives to ensure good capture of vapors. The tightness alternative may be one of the following: (1) A leak check performed during loading on all components using Method 21 of appendix A of 40 CFR part 60; (2) a pressure test, where the internal tanks are pressurized and the pressure drop is monitored over time to determine if the vessel is tight; or (3) for noninerted vessels (i.e., vessels having tanks that are not blanketed with nonreactive gas during loading to ensure that vapors in the tanks are below the explosive range), load the vessel at less than atmospheric pressure. These tightness alternatives are the same as those promulgated in the NESHAP for benzene (40 CFR part 61 subpart BB). The EPA does not have sufficient data necessary to determine at what point vessel leaks affect the operation and efficiency of the control system; however, the Agency believes that the three tightness alternatives proposed are sufficient to provide for the collection of nearly all displaced vapors. The EPA believes that once assured of good capture and collection of the vapors through the tightness tests, facilities can concentrate on the operation and maintenance of the control device as a means of ensuring compliance.

The EPA is proposing that vapor emissions captured from marine tank vessel loading operations can be controlled using one of two primary methods: Combustion or recovery. The primary devices used for

combustion of vapors are flares, enclosed flares (often referred to as thermal oxidizers), catalytic incinerators, and thermal incinerators. The primary methods for recovery of vapors include carbon adsorption, absorption, refrigeration, and vapor balancing. In States with marine tank vessel loading standards that allow both combustion and recovery, the control devices are evenly split between enclosed flares and carbon adsorption.

The EPA is proposing that standards for the control of vapors captured during the loading operations be one of the following: (1) A combustion device meeting 98 percent or greater destruction efficiency or (2) A recovery device meeting 95 percent or greater recovery efficiency. The difference in control efficiencies between recovery and combustion is designed to not prohibit recovery systems, which have smaller secondary air emission (sulfur dioxide, nitrous oxides, and carbon monoxide) impacts than combustion systems. The smaller emissions reduction is also warranted because these emissions are recovered as product instead of destroyed. Additionally, the EPA has data supporting the 95- and 98-percent control efficiencies as achievable for recovery and combustion devices, respectively (Docket A-90-44, items II-A-7 and II-B-1). For terminals that use recovery devices for control of gasoline vapor emissions, the EPA is proposing an alternative means of compliance. Such sources can comply by ensuring an outlet concentration of 1,000 ppmv or less for emissions from gasoline loadings. The EPA believes the 1,000 ppmv limit for gasoline vapor is generally more strict than the 95 percent reduction requirement. Data from an existing facility show this limit to be achievable (Docket A-90-44, item II-B-13). The intent of the concentration alternative is to allow those facilities that operate at a higher efficiency than required by the proposed standard to perform a simpler compliance test, as they would only have to test at the outlet of the control device. Because of the lower emission factors associated with crude oil emissions, the fact that hydrogen sulfide present in crude oil may poison the activated carbon, and that there are no known facilities controlling crude oil emissions with carbon adsorbers, the EPA is not proposing a concentration alternative for controlling vapors from crude oil emissions.

5. Impacts of the Proposed RACT Standards

The environmental, costs, energy, and economic impacts of the proposed RACT standards are summarized in Tables 1 through 3, and are represented by Regulatory Alternative II. They are also discussed in parts C.2. and C.3. above. Economic effects of the proposed RACT standards include a maximum price increase of approximately 0.2 percent and nationwide employment reductions of less than fifty. Up to five terminals controlled under the proposed standards could be under increased competitive pressure. Economic effects on oil tankers include

an average control cost per barrel of crude oil loaded equal to $0.002.

A primary concern in the implementation of the proposed standards is safety. Section 183(f)(1) dictates that the EPA consult with the Coast Guard and consider safety when promulgating these standards. Section 183(f)(2) states:

> Regulations on Equipment Safety.--Within 6 months after the date of the enactment of the Clean Air Act Amendments of 1990, the Secretary of the Department in which the Coast Guard is operating shall issue regulations to ensure the safety of the equipment and operations which are to control emissions from the loading and unloading of tank vessels, under section 3703 of title 46 of the United States Code and section 6 of the Ports and Waterways Safety Act (33 U.S.C. 1225). The standards promulgated by the Administrator under paragraph (1) and the regulations issued by a State or political subdivision regarding emissions from the loading and unloading of tank vessels shall be consistent with the regulations regarding safety of the Department in which the Coast Guard is operating.

The Coast Guard regulations (55 FR 25396) were promulgated in June 1990, before the passage of the amended Act. These standards dictate equipment, system, and operational requirements for vapor control systems for benzene, gasoline, and crude oil. The EPA has maintained communication with the Coast Guard throughout the rulemaking process. All control systems installed as a result of this proposed regulation would be subject to the Coast Guard regulations, and nothing in the proposed standard should be construed as to require any act or omission that would be in violation of any regulation or other requirements of the United States Coast Guard or prevent any act or omission necessary to secure the safety of a vessel or for saving life at sea. Representatives from the United States Coast Guard have participated in all phases of the development of these proposed rules. The EPA is confidant that these regulations are consistent with the Coast Guard regulations and that the safety factors have been adequately addressed.

6. Attainment/Nonattainment Status and Site Specific Risk Assessment

At one time, the Agency was considering planning regulating based exclusively under the authority of section 183(f). During this time, the Agency held a public meeting to discuss a possible approach for considering a facility's attainment/non-attainment status with respect to NAAQS ozone program and a facility's site specific risk to the public in developing the standards (see Docket A-90-44, item II-E-42). This approach would have required intensive effort on the part of the Agency and the regulated community to develop acceptable criteria and technological methodologies for demonstrating whether the criteria have

been met. However, with regulation under section 112, any facility that might have been exempted from RACT under section 183(f) with the approach discussed at the public meeting would ultimately be regulated under the MACT standards of section 112. Therefore, no further consideration was given to this approach.

D. Selection of MACT Regulatory Approach

1. Area Source Finding

The HAP emitted from this source category include benzene, toluene, hexane, xylene, and ethylbenzene from gasoline and crude oil loading as well as approximately 60 HAP from alcohols and specialty chemicals. Of the approximately 1,800 marine vessel terminals in this source category, at least 60 emit 25 ton/year of HAP or more, and are therefore considered major sources. In addition, under section 112(a)(1), a marine vessel terminal may be a part of a major source if it is part of a ``group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants." There are approximately 600 refineries and chemical production facilities in the United States; all of these are considered to be major sources. While the Agency does not have the data in its marine vessel data base to estimate how many of these facilities have bulk marine loading terminals that are contiguous to and under the same control as the main facility, there is a high correlation between large refineries and production facilities and large bulk loading terminals. Therefore, at a minimum, for purposes of this analysis, the Agency assumed that approximately 300 terminals are major sources because they are likely to be located at major sources such as refineries or chemical production facilities. This leaves approximately 1,200 facilities that are considered likely area sources. Based on the emissions data contained in the Agency's data base, these 1,200 facilities represent only 2 percent of nationwide HAP emissions.

Section 112(c)(3) states that categories of area sources emitting HAP may be listed and regulated if the Administrator finds the sources, individually or in the aggregate, present a threat of adverse effects to human health or the environment. Based on limited data available to the Agency, the Administrator is unable to determine a threat of adverse effects at this time. Therefore, the Agency is proposing not to regulate such area sources in this rulemaking. This is consistent with the Agency's decision not to include in its initial list of source categories those categories that contained no major sources and for which the Agency had not made a finding of threat of adverse effects

(57 FR 31576, July 16, 1992). The Agency may, however, revisit these sources in the future, if additional data become available.

2. Determination of Subcategories

The source category to be regulated is major sources of marine vessel loading and unloading operations. As part of the NESHAP development process, the source category was evaluated to determine if subcategorization of the source category was justified. Although the Act does not specify the criteria from which subcategories can be developed, section 112(d)(1) of the Act states that the ``Administrator may distinguish among classes, types, and sizes of sources within a category or subcategory * * *." The Agency believes that these same criteria are acceptable criteria to use in making subcategory determinations.

Size appears to be a likely candidate for a distinguishing feature, and using total estimated HAP emissions as an indicator for size, the EPA evaluated marine tank vessel loading operations to determine whether it was appropriate to subcategorize the source category on the basis of size. The limit for determining subcategories was examined in 0.5 Mg increments of HAP emissions from 0.5 Mg/yr to 2.0 Mg/yr. A subcategory based on 1 Mg of HAP emissions per year was selected for the following reasons. First, facilities that emit less than 1 Mg of emissions are likely to be area sources and therefore not subject to the proposed standards, or are facilities that are represented by relatively minimal, episodic emissions. For example, a typical river barge holds 10,000 barrels or 420,000 gallons of gasoline. An uncontrolled facility below a 1-Mg cutoff could be loading less than 30 barges per year. These facilities also typically emit less frequently than facilities emitting more than 1 Mg/yr and typically only load a single commodity. Additionally, these facilities also tend to load (and therefore emit) commodities having lower vapor pressures than commodities loaded at other, larger, facilities. Also, facilities that emit 1 Mg or more of HAP emissions contribute approximately 98 percent of HAP emissions to the national inventory. (See Docket A-90-44)

3. Determination of the MACT Floor

The MACT floors were determined for the following types of operations: Product loading and ballasting.

a. Product loading. The marine vessel data base is based on throughput data for marine vessel loading terminals. The throughput data are divided into crude oil, gasoline, and 11 other commodity categories. Additional information on these data are available in the TSD for this proposed regulation (see ADDRESSES section of this preamble). The EPA estimated the emissions of HAP from each of these terminals using these throughput data and incorporating assumptions about how many of these facilities were controlled, and the extent of their control. These assumptions are based on existing Federal and

State regulations. For example, benzene loadings are already controlled by the benzene NESHAP (40 CFR part 61, subpart BB). In addition, four States have regulations requiring control of emissions from marine tank vessel loading operations: New Jersey, Louisiana, Pennsylvania, and California (District regulations). (Additional information on the derivation of the MACT floor is found in Docket A-90-44, item II-A-44.) Additional discussion of the Agency's interpretation of the MACT floor is presented in section J. Solicitation of Comments.

Of the approximately 360 terminals estimated to be affected by the proposed regulation, 43 facilities comprise the best performing 12 percent of facilities used in calculating the MACT floor for terminals emitting over 1 Mg of HAP emissions. These terminals are subject to State regulations in California, New Jersey, and Louisiana. Averaging the required control levels of these facilities results in a MACT floor of 93 percent control for facilities emitting more than 1 Mg of HAP per year. Although this derived average does not precisely match a control technology, for all practical purposes it is equivalent the emission reduction achieved by recovery techniques (i.e., 95 percent). Additional information on the derivation of the MACT floor may be found in the docket for this proposed rulemaking effort.

There are approximately 1,440 facilities that would emit less than 1 Mg of HAP emissions annually if uncontrolled. The average control level of the best performing 12 percent of facilities is 36 percent control. This control level does not represent an existing technology. Therefore using the average of the best performing 12 percent is inappropriate for establishing the MACT floor. Taking the median of the best performing 12 percent of these sources (94th percentile) results in a control level of zero because the median facility is uncontrolled. This is a more appropriate portrayal of the level of control that exists in this subcategory. Therefore, this level of control (i.e., no control) represents the MACT floor for terminals emitting less than 1 Mg/yr.

The MACT floor for new facilities, regardless of size, is a 98-percent overall control of emissions. This control level represents the best performing similar source. The Agency will take comment on whether the MACT floor for new sources could, consistent with the requirements of section 112(d) of the Act, be equal to a control requirement of 95 percent when a recovery device is used. As discussed elsewhere in this preamble, the Agency wishes to encourage the use of recovery devices. However, a 95 percent reduction requirement for recovery devices may be considered inconsistent with the requirement of section 112(d)(3) of the Act that emission standards for new sources shall not be less stringent than the emission control achieved by the best controlled similar source. The EPA requests comments on whether the secondary benefits of recovery devices provide the Administrator with the ability

to determine that a 95 percent reduction requirement for those sources using recovery is ``not less stringent'' than a 98 percent reduction requirement for all other sources.

b. Ballasting. According to the Marine Board report, most tankships have segregated or clean ballast tanks due to Coast Guard regulations and international agreements that effectively prohibit ballast emissions from occurring. Since the Marine Board report was issued in 1987, as older vessels have been retired, the proportion of ``uncontrolled'' vessels has decreased further. However, the Agency does not have any information available to it to evaluate the percentage of vessels that still emit ballasting emissions, particularly those vessels that are not in crude oil service (where the vast majority of ballasting occurs). The Administrator determined that the MACT floor for ballasting at new or existing sources would be a prohibition of ballasting emissions. The Agency is requesting comment on this decision to prohibit ballasting emissions.

E. Selection of Basis and Level of Proposed MACT Standards

1. Development of Regulatory Alternatives

a. Product loading. Two regulatory alternatives were developed for the subcategory represented by major source marine tank vessel loading and unloading operations that emit less than or equal to 1 Mg of HAP annually. The regulatory alternatives are summarized in Table 4. The first alternative, Regulatory Alternative A, represents the MACT floor of no control. Regulatory Alternative B represents the control of a facility's total HAP throughput resulting in an overall emission reduction of 95 percent.

Two regulatory alternatives were considered for the subcategory represented by existing facilities emitting more than 1 Mg of HAP per year. Regulatory Alternative A represents the MACT floor level of control (93 percent overall control). Regulatory Alternative B represents the control of a facility's total HAP throughput to an overall control of 95 percent.

There are no regulatory alternatives for new facilities that exceed the MACT floor of 98 percent control because no other alternatives that are more stringent than the floor were considered technically feasible.

Table 4.--MACT Regulatory Alternatives<SUP>a

Regulatory alternative	HAP emissions reduction, Mg/yr	Percent HAP emissions limit	No. of affected terminals<SUP>b	Capital costs, $ million<SUP>c	Annual costs, $ million<SUP>c	Cost effectiveness, $/Mg	Incremental cost effectiveness,

	$/Mg						
For facilities emitting less than or equal to 1-Mg/yr HAP:							
A. No control (MACT floor)....	0	0	0	0	0	0	N/A
B. 95 Percent emission limit.....	125	95	1,200	1,800	430	3,400,000	3,400,000
For facilities emitting greater than 1-Mg/yr HAF<SUP>d:							
A. 93 Percent emission limit (MACT floor)....	1,300	93	240	570	130	99,000	N/A
B. 95 Percent emission limit..... (<SUP>e)	1,300	95	240	(<SUP>e)	(<SUP>e)	(<SUP>e)	

<SUP>aTerminals affected by State regulations or the benzene NESHAP are not included in these estimates.
<SUP>b``Affected Terminals" are terminals that would be required to control emissions.
<SUP>cCosts are in 1990 dollars.
<SUP>dTwenty-five facilities have HAP emissions greater than 1 Mg/yr and are affected by RACT. These facilities are
not included in these estimates.
<SUP>eGiven the structure of the UTD cost estimates, distinctions between the costs at 93 percent and 95 percent
emission reduction were not possible. However, costs would be at least as high as those shown at the 93
percent emissions reduction plus additional retrofit costs for vessels. (Retrofit costs for vessels range from
$9,000 to $61,000.)

Source: Docket A-90-44, items II-A-23, II-A-32, and II-A-34.

b. Ballasting. There are no regulatory alternatives beyond the MACT floor.

2. Impacts of the Regulatory Alternatives

The impacts of the product loading regulatory alternatives are summarized in Tables 4 through 6.

Table 5.--Secondary Air and Energy Impacts of MACT Regulatory Alternatives<SUP>ab

Regulatory alternative	SO_X emissions, Mg/yr[c]	NO_X emissions, Mg/yr[c]	CO emissions, Mg/yr[c]	Electricity impacts, MWh/yr[d]	Natural gas impacts 1,000 ft^3/yr[d]
For facilities emitting less than or equal to 1-Mg/yr HAP:					
A. No control (MACT floor).....	0.0	0.0	0.0	0	0
B. 95 Percent emission limit.....	0.5	28	27	114,000	12,000,000
For facilities emitting greater than 1-Mg/yr HAP:					
A. 93 Percent emission limit (MACT floor).....	6.6	64	61	27,000	3,000,000
B. 95 Percent emission limit.....	6.8	66	62	28,000	3,000,000

[a] Terminals affected by State regulations or the benzene NESHAP are not included in these estimates.

[b] Based on use of incineration.

[c] These impacts represent increases in emissions; increases would not be expected if all sources used recovery technologies.

[d] These impacts represent increases in energy usage.

Source: Docket A-90-44, items II-A-24 and II-A-33.

Table 6.--Summary of Economic Impacts by MACT Regulatory Alternative<SUP>a

Regulatory alternative	Terminals covered/ Maximum	Percent	No. of terminals Displacement

Regulatory alternative	throughout, potential by (million bbl/yr)	Total cost, ($MM)	percent price increase	output reductions	Employ-ment reductions	under competitive pressure	Impact on vessels pipeline
For facilities emitting less than or equal to 1-Mg/yr HAP:							
A. No control (MACT floor).	0	0	0	0	0	0	None..... None.
B. 95 Percent emission limit.	1,200 (320)	1,800	(<SUP>b)	(<SUP>b)	(<SUP>b)	(<SUP>b)	(<SUP>b)..... (<SUP>b)
For facilities emitting greater than 1-Mgy/r HAP<SUP>c:							
A. 93 Percent emission limit (MACT floor).	240 (750)	570	0.09-0.54	0-0.04	166	230	High level of dedication; retrofitting of vessels. Minimal.
B. 95 Percent emission limit.	240 (750)	(<SUP>d)	(<SUP>e)	(<SUP>e)	(<SUP>e)	(<SUP>e)	(<SUP>e)..... (<SUP>e)

<SUP>aTerminals affected by State regulations or the benezene NESHAP are not included in these estimates.

<SUP>bGiven the structure of the UTD data base, estimation of the impacts that would be anticipated at a control level more stringent than the MACT floor was not possible. However, it is expected that these impacts would br more severe than those expected for facilities emitting more than 1 Mg/yr of HAP.

<SUP>cTwenty-five facilities have HAP emission greater than 1 Mg/yr and are affected by RACT. These facilities are not included in these estimates.

<SUP>dGiven the structure of the UTD cost estimates, distinctions between the costs at 93 percent and 95 percent emission reduction were not possible. However, costs would be at least as high as those shown for the MACT floor plus additional vessel retrofit costs. (Vessel retrofit costs range from $9,000 to $61,000.)

<SUP>eGiven the structure of the UTD data base, distinctions between the impacts at 93 percent and 95 percent emission reduction were not possible. The impacts for facilities emitting greater than 1 Mg/yr of HAP would be at least as high as the impacts shown for the MACT floor, with higher impacts on vessels.

Source: Docket A-90-44, items II-A-23, II-A-32, and II-A-34.

3. MACT Determination

a. Product loading.--(1). Existing sources emitting 1 Mg/yr or less. Under Regulatory Alternative B, the average cost effectiveness to control existing facilities emitting less than 1 Mg/yr of HAP is approximately $3.4 million per Mg. The Administrator has determined that these costs are unreasonable and, as a result, that MACT for the subcategory represented by existing facilities with emissions less than or equal to 1 Mg per year of HAP emissions is equivalent to a MACT floor of no control. This determination follows section 112(d) of the Act where the Administrator is required to consider cost of achieving emission reductions beyond the MACT floor (among other criteria) when selecting MACT. These smaller facilities represent only 2 percent of all industry-wide emissions.

(2). Existing sources emitting greater Than 1 Mg/yr. The Administrator has determined that MACT for the subcategory represented by existing facilities with HAP emissions exceeding 1 Mg per year is the MACT floor of 93 percent overall control. The incremental benefits of additional control are not justified considering the costs of achieving these reductions.

The bulk of the incremental costs of control beyond the 93 percent emission limit (MACT floor) are the costs to retrofit a sufficient number of vessels to capture emissions beyond those required at the MACT floor and supplemental operating costs. Unfortunately, the Agency's marine vessel data base does not contain the type of data needed to analyze the nationwide cost effectiveness of a more stringent alternative. However, the average cost per facility to retrofit sufficient vessels to allow the facility to comply with the incremental emission reduction required for that facility to meet standards beyond the MACT floor ranges from approximately $9,000 to $60,000 per year. (Additional information on this analysis is found in Docket A-90-44, item II-A-23 and item II-A-32). In addition, there may be substantial additional costs to the facility to equip additional emission points (e.g., berths) with emission control equipment. The Administrator deems that any costs beyond the MACT floor, which itself has a cost effectiveness of over $90,000 per Mg, would not be reasonable. (The statute itself precludes the Administrator from selecting a less costly MACT floor.) Based on this limited analysis, the Administrator has elected to not require control beyond the MACT floor for this subcategory.

The selection of 93 percent emission limit as MACT for existing sources emitting greater than 1 Mg/yr should provide flexibility to terminals that install control equipment that is expected to achieve 95 to 98 percent emissions reduction. This flexibility enables facilities

to control HAP emissions in the most efficient manner by not requiring the control of liquids having minimal emissions. The Agency is soliciting comment on the need for this flexibility, and on methods to ensure enforceability of these standards given this flexibility.

It should be noted that the EPA does not believe that the analysis performed above for MACT-regulated facilities is applicable to the determination of RACT discussed in section III-C. The EPA believes that the incremental benefits of controlling the MACT-regulated terminals above 93 percent control is unjustified, given the costs already associated with the MACT standard. On the other hand, the RACT standards apply only to the largest crude oil and gasoline terminals in the United States. The cost effectiveness associated with requiring 95 or 98 percent control at these facilities is considerably more favorable than that associated with requiring 95 or 98 percent control for the MACT-regulated facilities. As shown above, the cost effectiveness associated with the RACT standard is $2,100/Mg, considerably less than that for the MACT standard. Therefore, the Agency believes that it is not appropriate to reduce the percent reduction requirements of the RACT standard to match those of the MACT standard. The EPA recognizes that for some individual facilities regulated under both sections 112 and 183(f), the RACT standard may be more stringent than the MACT standard. The EPA believes that this result is appropriate, but the EPA is taking comment on this issue. The EPA also notes that the control equipment required under both the MACT standard and the RACT standard must meet the 95 or 98 percent control threshold. The MACT standard offers flexibility with regard to the type of liquids controlled, not the manner in which they are controlled.

(3). New sources. The Administrator has determined that MACT for new facilities is the MACT floor, which is an overall control requirement of 98 percent. However, as discussed above, the EPA will take comment on whether MACT for new facilities could, consistent with section 112(d) of the Act, be equal to 95 percent reduction for recovery devices and 98 percent reduction for other destruction devices.

b. Ballasting. The Administrator believes that the combined impact of fleet turnover and Coast Guard and other regulatory requirements for tankships to use segregated ballast tanks means that there should be no impacts from the control (i.e., prohibition) of ballast emissions. As a result, MACT was determined to be equivalent to a prohibition of emissions from ballasting. However, as discussed in section J.2, Ballasting Emissions, the Administrator is soliciting comments and data on the possibility of significant impacts to currently uncontrolled vessels.

4. Selection of the Proposed MACT Standards

a. Product loading. As with the RACT standards, vessels loading at

facilities with controls must install a vapor collection system and pass one of three tank vessel tightness alternatives.

The MACT standards for existing facilities are based on a facility demonstrating that 93 percent of HAP emissions are controlled. Facilities would be allowed to demonstrate that the standard is being met in one of two ways. In the first case, a facility may choose to demonstrate that emissions from all vessels being loaded at the facility are being routed to either a 95 percent efficient recovery device or a 98 percent efficient destruction device. In the other case, the facility may opt to exclude the emissions of certain vessels or process lines from control, based on documented emission estimates, so long as at least a 93 percent overall level of control is achieved. The partial control of any commodity loaded or unloaded at the terminal would not be allowed as a means of showing compliance with the 93 percent overall emissions reduction standard. The facility would still be required to demonstrate that all controlled emissions are being routed to either a 95 percent efficient recovery device or a 98 percent efficient destruction device.

The MACT standards for new facilities require an emissions limit of 98 percent control. Additionally, these facilities would be required to maintain tank-tight vessels while loading.

b. Ballasting. Owners or operators of existing and new marine tank vessel loading and unloading operations would be required to demonstrate compliance with the ballasting standards by maintaining records showing that the vessels loaded met one of the following criteria: (1) The vessel does not perform ballasting at any time, (2) the vessel meets the Coast Guard standards, or (3) ballasting emissions are ducted to a control device.

5. Impacts of the Proposed MACT Standards

The environmental, costs, energy and economic impacts of the proposed MACT standards are summarized in Tables 4 through 6, and are represented by Regulatory Alternative A for facilities emitting less than or equal to 1 Mg of HAP and Regulatory Alternative A for facilities emitting more than 1 Mg of HAP. There are no projected impacts to controlling emissions from ballasting.

As discussed in section IV.C.5, the EPA believes that the potential safety impacts of the standards have been addressed.

The estimated impacts of the standards are a VOC reduction of 12,400 Mg/yr of which 1,300 Mg are HAP. The capital and annualized costs are estimated to be $570 million and $130 million, respectively.

The EPA performed an economic impact analysis of the MACT determination for this regulation. Potential price, output, and employment impacts for affected producers and for the marine transport industry were examined for each alternative. Potential small business impacts were also isolated. Additional information on these economic

impacts is available in the docket for this proposed regulation.

Estimated maximum price increases for the affected products varied but were not large (less than 1 percent) for any of the products under Regulatory Alternative A of the MACT determination for terminals emitting more than 1 Mg/yr. These price increase estimates reflect both the control cost increase for transporting crude oil and the control cost increase for transporting petroleum products. Because these price increases are small and because the elasticity of demand coefficients for petroleum products are small, estimated percent output (i.e., throughput) reductions were minimal. Correspondingly, estimated employment reductions were also small (less than 200).

Under Regulatory Alternative A of the MACT determination for terminals emitting more than 1 Mg/yr, potentially significant economic impacts on the smaller terminal operations that would have to install controls were identified. These significant impacts may have resulted from the high costs overall acting in combination with high per-barrel control cost differentials between the smaller and larger terminal operations that would have to control. It is expected that many of the smaller terminal operations would not be able to pass all of their control costs forward to consumers since they would be under increased competitive pressure from the larger terminal operations. It was estimated that up to 200 of the 264 affected terminal operations will have difficulty either absorbing control costs or passing along these costs to consumers under the proposed standard.

The potential economic impact on marine vessel owners is relatively small. Average control cost per barrel for tankers shipping crude oil or refined products was estimated to be $0.002 per barrel while owners or barges shipping refined products would face control costs of $0.08 per barrel. Because 77 percent of U.S. marine-transported petroleum product volume would be affected by these proposed standards, a significant percentage of U.S. marine vessels will need to be retrofitted. The vessels least costly to modify (most likely the larger, newer, double-skin vessels) will be retrofitted first, leading to a significant degree of dedicated service. It is expected that vessel owners that do retrofit will be able to pass retrofit costs forward to consumers.

As discussed above, a primary concern in the implementation of these proposed regulations is safety. Though section 112 of the Act does not specifically address U.S. Coast Guard regulations on safety, the EPA has endeavored to make sure that safety factors are adequately addressed and that nothing in the proposed regulations, whether proposed under section 183(f) or 112, is inconsistent with current U.S. Coast Guard regulations.

In addition, section 183(f)(2) of the Act requires that any regulations promulgated by any State or political subdivision regarding

emissions from the loading and unloading of tank vessels must be consistent with U.S. Coast Guard regulations regarding safety. This consistency requirement is equally applicable to any State or local regulation promulgated under the authority of the Clean Air Act section 112. Moreover, section 112(l) requires that the Administrator disapprove any program submitted by a State if the Administrator determines that the program is not likely to satisfy the objectives of the Act. The EPA believes that any State or local program that is inconsistent with U.S. Coast Guard safety regulations is ``not likely to satisfy the objectives of the Act'' and would therefore be disapproved by the Administrator.

F. Selection of Format for the Standards

The chosen format for the standards is a percent of mass emissions reduction. The percent of mass reduction format allows a focus on the final control device after good capture has been ensured. This approach is consistent with the benzene NESHAP (40 CFR part 61 subpart BB). Sufficient data to develop a mass per unit loaded standard were not available. Additionally, emission rates can vary between facilities and between vessels based on loading temperature and the arrival condition of the vessel, making it difficult to set an acceptable mass per unit loaded standard while ensuring good capture and control. Developing a mass per unit loaded standard would have required extensive testing and would need to be more stringent than the percent of mass reduction format in order to accommodate the varying terminal and vessel conditions. For this reason, a mass per unit loaded alternative is not being proposed.

The primary format, mass emissions reduction, for the MACT standards is the same as the RACT standards. However, because the MACT standards allow the source the flexibility to control only the portion of total facility emissions needed to meet the 93 percent reduction requirement, facilities may choose to calculate both potential uncontrolled and actual controlled emissions as part of the compliance demonstration.

Emissions from ballasting operations would be prohibited.

G. Selection of Test Methods

The proposed standards require the use of approved test methods to ensure consistent and verifiable results for initial performance tests and compliance demonstrations.

Different test methods are specified for combustion and recovery devices. For combustion devices, Method 25 of 40 CFR part 60, appendix A (Method 25) has been specified. Method 25 is appropriate for

measuring the VOC destruction efficiency of combustion devices whose output is greater than 50 ppmv. Given the large inlet concentrations associated with marine loadings, outlet concentrations of less than 50 ppmv are not expected.

For recovery devices, (Method 25A) of 40 CFR part 60, appendix A (Method 25A) has been specified. The (Method 25A) is appropriate for measuring the VOC removal efficiency of a nondestructive control device. Method 25A may be used for testing both removal efficiency and outlet concentration.

Because emissions and control efficiency also vary during the loading cycle, the EPA has determined that performance tests should be conducted to include the loading of the last 20 percent of a compartment, and may be spread out over multiple compartments. Data show that the greatest emissions occur during the last 20 percent of loading of a tank or compartment. The EPA believes that the control equipment should be designed to handle the peak loading emissions, which occur during this period.

The proposed standards also allow the use of any test method or test results validated according to the protocol in Method 301 of 40 CFR part 63, appendix A to allow owners or operators greater flexibility in testing.

Under today's proposed standards, owners or operators not having documentation of vessel vapor tightness would be required to test the vapor tightness of vessels using a pressure test provided in the regulation, or a leak test provided in Method 21 of 40 CFR part 60, appendix A. Methods are also provided for owners or operators loading under negative pressure. These test methods were first proposed for owners or operators of benzene transfer operations on September 14, 1989 (54 FR 38083) and were promulgated on March 7, 1990 (55 FR 8292). In the proposal of the benzene transfer operations NESHAP, comments were specifically requested regarding the suitability of these methods for these sources. Based on the comments received on these methods and the Agency's knowledge of the use of these methods under the benzene transfer NESHAP, the Agency is confident that these methods are suitable for determining vapor tightness for today's proposed regulation.

Regarding the emission estimation procedures to be followed in determining compliance with the proposed standards, the Agency is proposing that facilities use either actual test data or AP-42 emissions factors to identify emissions from the various commodities and streams loaded. The Agency is requesting comment on this approach for estimating emissions.

H. Selection of Monitoring and Compliance and Performance Testing Requirements

The proposed standards list parameters to be monitored for the

purpose of determining compliance. Monitoring requirements are proposed for both the vapor collection system and control devices. The vapor collection system monitoring requirements ensure that vent streams will not be diverted from the control device through the use of flow indicators or routine inspection of secured by-pass lines. While many forms of monitoring may qualify as enhanced monitoring, enhanced monitoring for tank vessel loading vapor control systems will generally be limited to a continuous control device parameter monitoring system, a continuous emissions monitoring system (CEMS), portable monitors, or a combination thereof.

The monitoring criterion for carbon adsorption is a CEMS for VOC concentration at the exhaust to atmosphere. The compliance condition will be no exceedance of the average concentration demonstrated during the facility's last compliance test. This monitoring criteria does not correspond precisely to the 95 percent reduction requirement, however it will be less costly to install and maintain than a system monitoring inlet and outlet and calculating removal efficiency.

The monitoring parameter for combustion devices, except flares, is combustion temperature. Combustion temperature is a strong indicator of performance. The temperature to be maintained will be determined from the facility's compliance test. For compliance purposes, temperature variation is limited to <plus-minus>5.6 deg.C (<plus-minus>10 deg.F) compared to the average temperature during the most recent compliance test.

The monitoring parameter for condensers is the exhaust stream temperature. Exhaust temperature directly correlates to exhaust concentration and is easier to monitor than outlet concentration. Coolant temperature was not chosen because it provides no guarantee of heat transfer efficiency or control efficiency. As with combustion devices, temperature deviations from the operating parameters established during the most recent compliance test are limited to <plus-minus>5.6 deg.C (<plus-minus>10 deg.F).

The monitoring requirements for flares are established in 40 CFR 60.18, which requires the owner or operator to monitor for the presence of a flame at all times.

The monitoring parameters for absorbers are the temperature and specific gravity of the scrubbing liquid. Deviations from the operating parameters established during the most recent compliance test are limited to 11 deg.C (20 deg.F) above the baseline scrubbing liquid temperature and <plus-minus>0.1 unit from the baseline scrubbing liquid specific gravity respectively.

Finally, in order to not prohibit the use of other control devices or new technology, a facility not using a control device for which enhanced monitoring criteria have been included may develop its own monitoring criteria and submit them to the Administrator for approval.

The Agency is also proposing alternative means of monitoring compliance with the standards at terminals using recovery devices for control of gasoline vapor emissions. These terminals would monitor the outlet concentration of VOC from the recovery device. Compliance with the standards is indicated provided that the VOC concentration is 1,000 ppmv or less. The EPA believes the 1,000 ppmv limit for gasoline vapor is generally more strict than the 95-percent control device efficiency requirement. Data from an existing facility show this limit to be achievable (Docket A-90-44, item II-B-13). The intent of the concentration alternative is to allow those facilities that operate at a higher efficiency than required by the proposed standard to perform a simpler compliance test, as they would only have to test at the outlet of the control device. The EPA does not have sufficient data to determine a ppmv emission limit for controlling VOC vapors from crude oil emissions. Nor does the EPA have sufficient data to determine a ppmv emission limit for controlling HAP vapors from crude oil emissions or other commodities. The EPA is soliciting data and comments regarding a ppmv limit for controlling non-gasoline VOC and HAP emissions and whether carbon adsorption would be used to control emissions from crude oil and other commodities.

I. Selection of Recordkeeping and Reporting Requirements

For enforcement purposes, it is necessary to require records and reports of various parameters at all facilities. Two types of records would be required to ensure compliance of facilities required to install controls: (1) Monitoring results from the most recent performance test and (2) results from periods when the measurement of parameters significantly deviated from measurements of the same parameters during the most recent performance test. Reports of those periods when monitored parameters were significantly outside the specified range would be submitted quarterly. These reports are necessary to ensure that the control equipment is maintained in good operating condition.

Additionally, owners or operators would be required to keep vapor tightness documentation for marine vessels loaded on file in a permanent form available for inspection. The owner or operator would be required to update the vapor tightness documentation at least once per year to ensure that only vapor tight marine vessels are loaded.

Owners or operators of affected facilities seeking to demonstrate compliance with the 93 percent emission reduction standard must maintain records of their determination of HAP control efficiency and must submit quarterly reports of the source's HAP control efficiency calculated from their actual throughputs. The Agency is soliciting comment on these requirements. Specifically, the Agency requests

information on the type and method of documentation that should be required to assure compliance with the 93 percent emission reduction standard.

J. Solicitation of Comments

The Administrator specifically requests comments on the topics discussed in this section. Commenters should provide available data and rationale to support their comments on each topic.

1. Subcategories

The Agency has proposed to establish a subcategory for terminals emitting less than 1 Mg/yr of HAP. The Agency is also requesting comment on whether off-shore terminals and the Valdez Marine Terminal should be placed in separate subcategories under section 112 of the Act. The Agency requests comment regarding whether subcategories should be established for other types of terminals based on particular characteristics of these types of terminals of which the Agency currently has no information. EPA also requests comments on whether further subcategorization based on size is warranted.

a. Offshore terminals. The Agency does not believe that a facility which is at least one-half mile offshore is part of a land-based contiguous site. Offshore terminals (both those with subsea lines and platforms) that are part of a contiguous terminal (i.e., offshore terminals less than 1/2 mile from shore) present unique regulatory challenges such as the cost and environmental impacts of installing additional subsea lines to carry vapors to land-based equipment. Size constraints, permitting difficulties, and other concerns may be issues with an offshore control system. The EPA is proposing that offshore terminals exceeding the throughput cutoffs and emission limits be subject to the proposed regulations and control vapors to the same extent as onshore facilities. The EPA is soliciting information and comments regarding the feasibility and cost of controlling emissions from offshore terminals. Comments are also requested on the grouping of offshore facilities into a separate subcategory with different control requirements under MACT.

b. Additional subcategory for the valdez marine terminal. On December 29, 1993, the Alyeska Pipeline Service Company (``Alyeska") sent a letter to the Agency regarding this proposed rule (see Docket A-90-44, item II-D- 65). In the letter, Alyeska discussed an alternative regulatory approach that would allow the use of less stringent controls at Alyeska's Alaska Valdez Marine Terminal (VMT). Alyeska ``believes that the optimal vapor emission control system for the VMT is a system that captures and recovers vapors from tanker loading, rather than one that incinerates captured vapors." Alyeska believes that it can successfully design a vapor recovery system for the VMT but intuitively

believes that the emission reduction that such a system can achieve will be less than the percentage emissions reduction achieved by significantly smaller systems and particularly those which address emissions from refined petroleum products rather than crude oil. Alyeska also believes that a vapor recovery system for the VMT is unlikely to meet today's proposed requirements of a 95-percent emission reduction of VOC and HAP for recovery devices under section 183(f) and section 112, respectively. In addition, Alyeska states that the VMT should be placed in a separate category or subcategory under section 112(d) because Alyeska believes the VMT is unique among U.S. marine terminals.

Alyeska has also suggested separately (see Docket A-90- 44, item II-D-71) that a recovery device may be available to VMT that could meet a HAP emission reduction requirement approaching 93 percent but that would likely not meet a VOC reduction requirement above 70 percent. Alyeska suggests that as it is located in an ozone attainment area in an extreme northern climate where formation of ozone is not a practical concern, a lesser VOC reduction requirement may be reasonable under section 183(f). The proposed format for the Section 112 emission limit requires the VMT to reduce all the crude emissions by 95 percent when using a recovery device. The EPA requests comments on whether this format could be changed to allow for a 93-percent reduction of emissions for less efficient control technologies.

The EPA made no changes to the proposed standard in response to Alyeska's letter. However, the EPA is seeking public comment on the issues addressed by Alyeska. In addition, Alyeska intends to provide the EPA with further documentation supporting its position before the end of the public comment period. The EPA will consider this new information in addition to currently available information in deciding the final standard. Currently available information which will be considered is described in the following paragraphs.

Section 183(f) requires the application of RACT considering ``costs, any non-air quality benefits, environmental impacts, energy requirements and safety factors associated with alternative control techniques." Section 112(d) requires the application of MACT considering the ``cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements." (In addition, as described previously, a minimum control level is specified, referred to as the floor.)

Section 112(c) requires the EPA to establish categories and subcategories of sources for regulation under section 112(d). In the EPA's notice of initial list of categories, the EPA stated that ``a category of sources is a group of sources having some common features suggesting that they should be regulated in the same way and on the same schedule." (57 FR 31578, July 16, 1992). The EPA also noted that

``criteria that may need to be considered in defining categories of similar sources include similarities in: process operations (including differences between batch and continuous operations), emissions characteristics, control device applicability and costs, safety and opportunities for pollution prevention" (57 FR 31580). To justify VMT being placed in a separate category or subcategory, it needs to be shown that VMT has distinctions that are relevant from a regulatory standpoint (given the restrictions of section 112), in determining whether the VMT can be regulated in a similar manner as other terminals.

The VMT is the largest crude oil loading facility in the U.S. with hourly crude loading rates more than 15 times that of any other marine terminal. The VMT is one of only a few terminals which are exclusively used for crude oil loading.

Alyeska has acknowledged that it could use a combustion device at VMT to achieve a 98 percent reduction in emissions. However, Alyeska has raised concerns about the feasibility of recovering crude oil vapors with a 95 percent efficiency using conventional recovery devices such as carbon adsorbers.

According to Alyeska the design and construction of a vapor recovery system for the VMT would be technically more complicated than for any other marine terminal. This is because no existing vapor recovery system is currently operating on as large a vapor stream as the VMT terminal, there is great complexity in recovering crude oil vapor (as opposed to petroleum product vapor), and for reasons discussed in the following paragraph, a VMT recovery system would have to be designed to operate efficiently over a broad range of declining input volumes. In addition, the sub-Arctic climate of the region presents unique problems with regard to handling water vapor in terms of both complications on the technical processes by which crude oil vapors can be recovered and in terms of monitoring accuracy. Different and more complex operating parameters must be considered in the design and construction of a vapor recovery system that will operate effectively on the VMT crude oil stream because the number and range of volatility of the hydrocarbon components are greater in a crude oil stream than in a product stream. Alyeska believes that it may not be possible to achieve as high a recovery from a crude oil vapor stream as is achievable from a product vapor stream because of this difference in the number and range of volatility of the hydrocarbon components.

The throughput in the Trans-Alaskan Pipeline (TAP), which supplies the crude for loading at the VMT, is expected to decline such that the volume of vapors that must be handled by the VMT recovery system will decrease with time. In 1988 annual TAP throughput reached a peak of 2.14 million barrels per day. Throughput subsequently has declined to a current level of 1.62 million barrels per day (average year to date for

1993) and estimates indicate that production will continue to decline over the life of the now declining North Slope oil fields. An emission control system designed for the VMT needs to be able to operate efficiently over a broad range of declining input volumes. When considering declining throughput, a recovery system enables more design flexibility than an incineration system because recovery systems require enough contact with either surface area or scrubbing liquid to ensure high recovery; as flow decreases contact increases which marginally increases recovery. Therefore, a facility may design very large control units or smaller parallel units, both of which will function at design efficiency. An incinerator is not as flexible in operation as a recovery system. An incinerator requires proper mixing of the waste stream and the flame and mixing becomes poorer as flow rates decline. Large incinerators cannot be run at flow rates much lower than one half design rates without affecting mixing and corresponding combustion efficiency.

In addition the VMT will require the use of ``active'' detonation arrestors instead of ``passive'' detonation arrestors used at other marine terminals, due to the amount of vapors that must be collected and the distance between the vessel loading berths and vapor recovery facilities. Alyeska has developed active detonator arrestors that have been approved by the Coast Guard, because passive detonation arrestors would not protect a VMT type system from explosion.

Alyeska estimated that the additional amount of energy that could be conserved by recovering (instead of incinerating) tanker vapors at the VMT would be as great or greater than the energy that could be saved by recovering tanker vapors at all other U.S. crude oil loading marine terminals combined (about 250,000 barrels at current throughput). Both recovery and incineration result in other air pollutants including particulate matter (PM), sulfur oxides (SO<INF>X), nitrogen oxides (NO<INF>X), carbon monoxide (CO), and carbon dioxide (CO<INF>2). Vapor recovery may be more advantageous when considering the overall contribution of all pollutants to the environment.

The proposed standard does not treat a facility such as the VMT as a separate category or subcategory. However, the EPA is still considering whether these characteristics described above are sufficient to warrant treatment of a facility like the VMT as a separate subcategory, and is requesting additional information and public comments on this issue. Comment is also requested on the extent to which these factors, largely related to recovery devices, should be considered if such a facility can use an incinerator. Additional information is sought on the extent to which factors such as a different detonator device are relevant to the decision. The EPA also invites comment on Alyeska's suggestion that a VOC reduction requirement less stringent than 95 percent is appropriate for a

terminal in an ozone attainment area in an extreme northern climate where ozone formation is not a practical concern. The EPA will evaluate all information and comments submitted in making a final determination before promulgation of the standard.

Alyeska states that diminishing throughput could eliminate the need for control equipment at all berths in the future; if throughput continues to decline, the VMT will eventually be able to handle the entire throughput at only two berths instead of the four available berths. Alyeska has raised an issue concerning the need to control the berths normally not in use if they are used for ``emergency purposes.'' The issue is independent of the choice of control systems and would not be considered in a determination of whether it is appropriate to put the VMT in a separate subcategory. However, the EPA may evaluate a regulatory approach which requires full control of emissions at the primary loading berths, but allows occasional use of uncontrolled berths. This type of regulatory scenario assumes that emissions from the uncontrolled berths would be negligible when compared to emissions to the controlled berths. For the EPA to evaluate such an approach requires VMT to provide detailed information on the impacts and tradeoffs for various scenarios of the controlled versus uncontrolled berths. The EPA is requesting comments on this type of approach, including the need to limit frequency of use or mass emissions, and the details that should be in the rule to ensure compliance.

If facilities with characteristics like the VMT were in a separate subcategory, the MACT floor would appear to be no control. The EPA would consider requiring control levels more stringent than the MACT floor. The tradeoffs between incineration and vapor recovery would be considered in this determination, and also in the determination of RACT under section 183(f). The declining throughput and its affect on the number of berths would also be considered in this decision.

Alyeska is still studying the total impacts associated with vapor recovery systems. Currently, Alyeska has not yet provided the EPA with the control efficiency of the recovery process, the energy requirements, costs, or the secondary pollutants associated with recovery; nor has Alyeska provided evidence showing that a 93 or 95 percent reduction in emissions of HAP using a recovery device is infeasible at VMT. Moreover, given that the EPA's definition of VOC does not include methane and ethane, there is some question as to whether a 95 percent reduction in VOC is in fact possible using recovery at the VMT. Additional information is also needed on the declining throughput, its effect on the number of berths controlled, and the tradeoffs involved. The EPA could possibly consider the trade-offs among HAP, VOC, PM, SO<INF>X, NO<INF>X, CO and CO<INF>2 in addition to energy savings when evaluating recovery versus incineration. The EPA invites comment on whether a regulatory approach

that would allow the use of a less stringent vapor recovery system at the VMT is permissible and appropriate under the Act. Such comments should include the consideration of tradeoffs between HAP, other pollutants, energy, and whether consideration of such tradeoffs is permissible under sections 112 and 183(f). Before promulgating a final rule, the EPA will evaluate all additional information, data, and comments submitted. Based on this evaluation, the promulgated standards could be set at the proposed RACT and MACT levels, but the EPA will examine all information relevant to including a separate subcategory for large crude terminals and establishing a different MACT level for each subcategory.

2. Ballasting Emissions

In preparing today's proposed rule the Agency has assumed that the prohibition of ballasting emissions does not contain any impacts for industry because of the U.S. Coast Guard regulations requiring segregated ballasting tanks. The Administrator is soliciting comments and data that might indicate that there are potential impacts to certain classes of vessels, particularly those carrying noncrude oil product. In addition, the Administrator encourages comment on how a prohibition of ballasting emissions could be implemented most effectively.

3. Alternative Concentration-Based Compliance Determination

For terminals that use recovery devices for control of gasoline VOC and/or HAP emissions, the EPA is proposing an alternative means of compliance to the proposed standards. The EPA is soliciting data and comments regarding a ppmv limit for controlling non-gasoline VOC and HAP emissions and whether carbon adsorption would be used to control emissions from crude oil and other commodities.

4. Vessel Tightness Testing

The proposed standards require vessels to undergo one of three tightness tests at least every 12 months. The Administrator is soliciting data on the frequency of leaks on marine vessels to determine whether the interval between tests is appropriate. The Administrator is also requesting data on the effectiveness of requiring vessels to undergo one of these three tightness tests.

5. Procedures to Estimate HAP Emissions

The TSD describes the limited data regarding marine vessel loading emission factors available to the Administrator to use in estimating HAP (or VOC) emissions from marine vessel loading operations. While these data are sufficient to estimate emissions as part of regulatory impact analyses, they may not be sufficient for the Administrator to require the use of specific emission factors in the emission estimation alternative allowed under the proposed part 63 standards for existing sources. For this reason, facilities wanting to take advantage of this alternative will develop and submit documentation of emission estimates

on a case-by-case basis. The Administrator requests that commenters submit data on possible emission factors and/or alternative emission estimation procedures for consideration in the final rule.

6. RACT Standard of 93 Percent Reduction

As discussed above, for those sources regulated under section 183(f) of the Act, the EPA is requiring that such sources reduce emissions at their facility overall by 95 percent if using a recovery device or by 98 percent if using a destruction device. Nevertheless, the Agency specifically decided not to increase the stringency of its MACT standard, for those existing sources regulated under section 112, beyond a reduction level of 93 percent because the cost effectiveness level of such an increase would not be reasonable.

The Agency believes that it is reasonable, given the associated cost effectiveness values, to require the facilities regulated under section 183(f) (the largest terminals of their kind in the U.S.) to reduce emissions by 95 or 98 percent, despite the fact that the Agency is requiring only 93 percent reduction for the terminals regulated under section 112. However, the EPA understands that it is unusual for a RACT standard for any single source to be more stringent than a MACT standard for that source, as it may be for certain sources regulated under both sections 112 and 183(f).

The Agency requests comment on whether the analysis performed for regulation of sources under the MACT standard of section 112 is equally valid under the RACT standard of section 183(f). That is, given the cost effectiveness values associated with decreasing the stringency of the RACT standard from 95 or 98 percent control to 93 percent control, would it be reasonable, ``considering costs, any nonair-quality benefits, environmental impacts, energy requirements and safety factors,'' for the Agency to promulgate a standard of 93 percent control for those sources regulated under section 183(f), in addition to those sources regulated solely under section 112?

7. Carbon Bed Regeneration Emissions

In the proposed regulation, the Agency is prohibiting HAP emissions from the regeneration of a carbon bed when a carbon bed adsorber is used to control HAP emissions. The Agency is requesting comment on this requirement.

Specifically, the Agency requests comment on the degree to which steam stripping (in which steam is used to regenerate these carbon beds) is used at affected sources.

8. MACT Floor Determination

In a March 9, 1994, Federal Register notice reopening the public comment period for determination of ``MACT floor'' for NESHAP source categories (59 FR 11018), the Agency considered more than one interpretation of the statutory language concerning the MACT floor for existing sources and solicited comment on them. The MACT floor decision

that the EPA will make on the basis of this March 9, 1994, notice will have broad precedential effects, and will presumptively be followed by the Agency in any rulemakings subsequently promulgated under Title III of the Act. The MACT floor determinations proposed in today's rulemaking may therefore be affected by the Agency's final interpretation of ``MACT floor."

Sections 112(d)(3) (A) and (B) of the Act require that the EPA set standards no less stringent than ``the average emission limitation achieved by the best performing 12 percent of the existing sources" if there are at least 30 sources in a category, or ``the average emission limitation achieved by the best performing 5 sources" if there are fewer than 30 sources in a category. During the development of this proposed rule, the EPA considered two interpretations of this statutory language. One interpretation groups the words ``average emission limitation achieved by" together in a single phrase and asks what is the ``average emission limitation achieved by" the best performing 12 percent. This interpretation places the emphasis on ``average." It would correspond to first identifying the best performing 12 percent of the existing sources, then determining the average emission limitation achieved by these sources as a group. Another interpretation groups the words ``average emission limitation" into a single phrase and asks what ``average emission limitation" is ``achieved by" all members of the best performing 12 percent. In this case, the ``average emission limitation" might be interpreted as the average reduction across the HAP emitted by an emission point over time. Under this interpretation, the EPA would look at the average emission limits achieved by each of the best performing 12 percent of existing sources, and take the lowest. This interpretation would correspond to the level of control achieved by the source at the 88th percentile if all sources were ranked from the most controlled (100th percentile) to the least controlled (1st percentile). For today's proposed regulation, the Administrator is using the first interpretation described above, which interprets the statutory language to mean that the MACT floor for existing sources should be set at the level of control achieved by the ``average" of the best performing 12 percent.

In establishing the MACT floor for today's proposed regulations, the EPA also considered two possible meanings for the word ``average" as the term is used in section 112(d)(3) (A) and (B) of the Act. First, the EPA considered interpreting ``average" as the arithmetic mean. The arithmetic mean of a set of measurements is the sum of the measurements divided by the number of measurements in the set. The EPA determined that the arithmetic mean of the emissions limitations achieved by the best performing 12 percent of existing sources in some cases would yield an emission limitation that fails to correspond to the limitation achieved by any particular technology. In cases where this limitation

existed, the EPA decided not to select this approach. The EPA also considered interpreting ``average'' as the median emission limitation value. The median is the value in a set of measurements below and above which there are an equal number of values (when the measurements are arranged in order of magnitude).

For the subcategory of sources emitting 1 Mg/yr or more of HAP, the Agency determined that the derived arithmetic mean, for all practical purposes, is equivalent to recovery technologies and thus the Agency used the mean to determine the MACT floor for this subcategory. The EPA selected the median for the subcategory of sources emitting less than 1 Mg/yr of HAP because the arithmetic mean yields a value that does not correspond to a particular emission control technology.

The EPA solicits comment on its interpretation of ``the average emission limitation achieved by the best performing 12 percent of the existing sources'' (section 112(d)(3)(A) of the Act) and its methodology for determining the MACT floor.

9. Monitoring Parameters

The proposed standard requires that terminals using a combustion device to comply with the standard monitor the combustion temperature computed every hour as an hourly average, and every third hour as a 3-hour block average. Operation of the affected source in deviation of the baseline temperature developed during the compliance test in excess of 5.6 deg.C (10 deg.F) constitutes noncompliance with the standard. The baseline temperature is averaged over the loading cycle. The Agency believes that it is appropriate to average temperatures measured during the compliance test to establish a baseline temperature to which monitored data can be compared. The Agency is soliciting comments on the effect of the proposed averaging times on the parameter's effectiveness in ensuring compliance with the proposed standards.

IV. Administrative Requirements

A. Public Hearing

The EPA will hold a public hearing to discuss the proposed standard in accordance with section 307(d)(5) of the amended Act. Persons wishing to make oral presentation on the proposed standards for marine tank vessel loading operations should contact the EPA at the address given in the ADDRESSES section of this preamble. The EPA will limit oral presentations to 15 minutes each. Any member of the public may file a written statement before, during, or within 30 days after the hearing. Send written statements to the Air Docket Section address given in the ADDRESSES section of this preamble and should refer to Docket A-90-44.

The EPA will make a verbatim transcript of the hearing and written

statements available for public inspection and copying during normal working hours at the EPA's Air Docket Section in Washington, DC (see ADDRESSES section of this preamble).

B. Docket

The docket is an organized and complete file of all of the information submitted to or otherwise considered by the EPA in the development of this proposed rulemaking. The principal purposes of the docket are (1) to allow interested parties to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process and (2) to serve as the record in case of judicial review (except for interagency review materials) (section 307(d)(7)(A) of the amended Act).

C. Office of Management and Budget Reviews

1. Paperwork Reduction Act

The information collection requirements in this proposed standard have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. An Information Collection Request (ICR) document has been prepared by the EPA (ICR No. 1679.01), and interested parties may obtain a copy from Sandy Farmer, Information Policy Branch, EPA, 401 M Street, SW. (2136), Washington, DC 20460, or by calling (202) 260-2740. The public reporting burden for this collection of information is estimated to average 265 hours per respondent per year, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked ``Attention: Desk Officer for the EPA." The final standard will respond to any OMB or public comments on the information collection requirements contained in this proposal.

2. Executive Order (E.O.) 12866 Review

Under Executive Order 12866, (58 FR 51735 (October 4, 1993)) the Agency must determine whether the regulatory action is ``significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines ``significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or

adversely affect in a material way the economy, a section of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a ``significant regulatory action'' because an annual effect on the economy of $100 million or more is anticipated. As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

D. Regulatory Flexibility Act Compliance

The Regulatory Flexibility Act (Pub. L. 96-354, September 19, 1980) requires consideration of the impacts of regulations on small entities, which are small businesses, small organizations, and small governments. The major purpose of this Act is to ensure consideration of regulatory alternatives that might mitigate adverse economic impacts on small entities. If a preliminary analysis indicates that a proposed regulation is likely to have a significant economic impact on a substantial number of small entities, a regulatory flexibility analysis must be performed to examine alternatives that might lessen such effects.

The EPA performed an economic impact analysis of the MACT determination considered for this regulation, which included a preliminary assessment of the potential adverse impacts on small entities. Two types of businesses were identified that could incur adverse small business impacts: marine terminal operations and marine vessel operations.

With regard to marine terminal operations, the proposed standards exempt facilities with HAP emissions of less than 1 Mg/yr. This reduces the number of impacted terminals from approximately 1,450 to 264. These exemptions allow the smallest operations to avoid installation of controls. These exemptions greatly reduce per-barrel control cost differentials that, as indicated in the economic impact analysis, would make it difficult for owners of the smallest terminals to pass forward control costs to consumers had no or fewer exemptions been made. With

the proposed standards, however, it is expected that a large portion (up to 200) of the 264 regulated terminals will only be able to pass a fraction of the control costs on to consumers in the form of higher prices. This condition is attributable to the EPA's assumption that loading costs will increase by the average cost of control, that terminals are competitive and that higher than average control cost terminals will have to absorb those differences. Thus, the economic impact on these terminal owners is expected to be significant because of the impact of cost absorption on profitability and/or difficulty in raising capital for the control system. On the other hand, of those 200 terminals, it is expected that many are part of large integrated petroleum operations, have easier access to capital and will remain open. Some with higher than average control costs will also be in a position to raise their prices as much as their control costs because of favorable locations or other market conditions. However, the overall number of small business terminal operations significantly affected by this regulation is expected to be substantial.

With regard to marine vessel operations, the economic impact analysis considered all of these operations to be small businesses. The number of vessel operations estimated to be impacted by the proposed standards is expected to be substantial since a significant percentage of the petroleum products transported via marine vessels will be affected by the standards. Excluding volume from the three large crude oil terminals affected (these terminals are served by large oil tankers with insignificant estimated retrofit costs ($0.002/bbl), 77 percent of the U.S. marine transported throughput of controlled products and crude oil will be affected by the standards. That same volume percentage of the fleet marine vessels will need to be retrofitted to service regulated terminals. It is expected, however, that many of these vessel owners will be able to pass forward retrofit costs in the form of higher transport prices.

The Agency has therefore judged that a significant economic impact on a substantial number of small entities (namely terminals) will likely result from the proposed standards and that a regulatory flexibility analysis should be performed.

List of Subjects in 40 CFR Part 63

Environmental protection, Air pollution control, Intergovernmental relations, Reporting and recordkeeping requirements, Tank vessel standards.

Statutory Authority

The statutory authority for this proposal is provided by sections

101, 112, 114, 116, 183(f) and 301 Clean Air Act, as amended; 42 U.S.C. 7401, 7411, 7414, 7416, 7511b(f), and 7601.

Dated: April 29, 1994.
Carol M. Browner,
Administrator.
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